

4. EXISTING ENVIRONMENT

4.1 TOPOGRAPHY

The Solvay Soda Ash Joint Venture facility is located in southwestern Wyoming in Sweetwater County approximately 60 kilometers (37 miles) west of Rock Springs. The project area is in the Green River drainage basin bounded by the Wyoming Ranges to the west and northwest and the Wind River Range to the northeast. The Flaming Gorge National Recreation Area is located to the southeast. Elevations in the project area generally range from 6200 ft to 6600 ft.

4.2 AIR QUALITY

Ambient air quality monitoring has been conducted in the project area. Previously monitored parameters included SO₂, NO_x, and total suspended particulate (TSP). Currently, PM₁₀ and PM_{2.5} (particulate matter less than 10 and 2.5 µm, respectively) are monitored both upwind and downwind of the facility, with a single TSP monitor located downwind. Maximum measured pollutant concentrations are presented in Table 4-1 and can be compared to Wyoming Ambient Air Quality Standards (WAAQS) and the National Ambient Air Quality Standards (NAAQS) presented in Table 4-2. The NO_x concentration for the first quarter of 1987 was 0.01 ppm (18.8 µg/m³). However, the quarterly averages for the remainder of the monitoring year were rounded to 0.00 ppm. This resulted in an annual average NO_x concentration of 0.0025 ppm (4.7 µg/m³). SO₂ and NO_x concentrations in the project area are considerably below applicable WAAQS and NAAQS. Ambient monitoring of SO₂ and NO_x was discontinued in 1988, due to the low concentrations monitored. There has never been an exceedance of PM₁₀ since monitoring began in 1989.

Table 4-1: Maximum Measured Pollutant Concentrations

Pollutant		Averaging Time	Concentration ($\mu\text{g}/\text{m}^3$)	Year
PM₁₀	Upwind	24 hr.	27	1996
		2nd highest 24 hr	26	
		Annual	10.22	
	Downwind	24 hr.	34	1996
		2nd highest 24 hr	27	
		Annual	13.88	
SO₂		3 hr.	78.2	1987
		24 hr.	26.1	
		Annual	0	
NO₂		Annual	4.7	1987

Table 4-2: National and Wyoming Ambient Air Quality Standards

SUMMARY OF NATIONAL AND WYOMING AMBIENT AIR QUALITY STANDARDS				
POLLUTANT	NAAQS			
	AVERAGING TIME	PRIMARY $\mu\text{g}/\text{m}^3$ (ppm)	SECONDARY $\mu\text{g}/\text{m}^3$ (ppm)	WAAQS $\mu\text{g}/\text{m}^3$ (ppm)
Carbon Monoxide ^a	1-hour ^b	40 (35)	40 (35)	40 (35)
	8-hour ^b	10 (9)	10 (9)	10 (9)
Nitrogen Dioxide	Annual	100 (0.05)	100 (0.05)	100 (0.05)
Ozone	1-hour ^c	235 (0.12)	235 (0.12)	160 (0.08)
Particulates (PM10)	24-hour ^b	150 (—)	—	150 (—)
	Annual (arith. mean)	50 (—)	—	50 (—)
Sulfur Dioxide	3-hour ^b	—	1300 (0.05)	1300 (0.05)
	24-hour ^b	365 (0.14)	—	260 (0.10)
	Annual	80 (0.03)	—	60 (0.02)
Hydrogen Sulfide	1/2-hour	—	—	70 (0.05) ^d
		—	—	40 (0.03) ^e
Lead	Calendar Quarter	1.5 (—)	1.5 (—)	1.5 (—)
^a In mg/m^3 (and ppm). ^b Not to be exceeded more than once per year. ^c Not to be exceeded more than 1 day per year, based on a 3-year running average. ^d Not to be exceeded more than 2 times per year. ^e Not to be exceeded more than 2 times in any five consecutive days.				

An IMPROVE (Interagency Monitoring of Protected Visual Environments) visibility monitoring system was installed in the Green River basin during the summer of 1996. The site includes a transmissometer, nephelometer, aerosol monitors, and meteorological monitors. This visibility data is still preliminary, but will be available in the future.

4.3 CLIMATE AND SITE METEOROLOGY

Wyoming can be characterized as having a combination of a highland climate and a mid-latitude semiarid climate. The dominant factors which affect the climate of the area are elevation, local relief, and the mountain barrier effect. This barrier effect can produce marked temperature differences between windward and leeward slopes. Generally temperatures decrease and precipitation increases with increasing elevations.

The nearest available precipitation and temperature data are collected at Green River and Rock Springs, Wyoming, respectively, to the east of the project location. Precipitation amounts are generally consistent throughout the year with May being the wettest month and February the driest month.

The average annual precipitation at Green River is 7.74 inches. However, mid-latitude semiarid climates are characterized by great variability of precipitation from year to year. A summary of precipitation amounts is presented in Table 4-3. Temperatures in mid-latitude semiarid regions are marked by large diurnal and seasonal ranges. At Green River, temperatures range from an average minimum near 0°F in January to an average maximum of near 90°F in July. Temperature extremes as high as 104°F and as low as -42°F have been recorded. A summary of monthly and annual average temperatures is presented in Table 4-4.

Table 4-3: Average Precipitation - Green River, Wyoming

MONTH	PRECIPITATION (inches)
January	0.39
February	0.31
March	0.50
April	0.81
May	1.21
June	0.98
July	0.63
August	0.76
September	0.68
October	0.73
November	0.40
December	0.34
Annual Total	7.74 INCHES
Source: NOAA	

Table 4-4: Average Temperature for the Rock Springs, Wyoming Airport

Month	Maximum (°F)	Minimum (°F)	Mean (°F)
January	32.1	4.7	18.4
February	37.5	8.9	23.2
March	44.5	16.8	30.7
April	55.7	26.9	41.3
May	67.9	36.0	52.0
June	77.9	43.4	60.7
July	87.0	49.4	68.2
August	84.1	47.2	65.7
September	74.8	36.8	55.9
October	63.0	26.8	44.9
November	45	15.8	30.4
December	35.4	7.3	21.4
Annual Mean	58.7	26.7	42.7
Source: NOAA			

Wind data are collected at Rock Springs, Wyoming, to the east of the project site. Although wind patterns are significantly influenced by local topography, the predominant wind directions at Rock Springs are from the west through southwest. Maximum wind speeds are associated with west winds.

4.4 SOILS AND VEGETATION

Soils in southwest Wyoming vary in physical and chemical characteristics as determined primarily by geologic, topographic, vegetative, and climate factors. The area is characterized by uplifted fault blocks which form the major ridge and relatively flat-lying

clay shales and siltstone forming the intervening valleys. The ridges are mainly composed of limestones, dolomites, and quartzes of Paleozoic and older Mesozoic age. Side ridges and valleys are formed by the Wasatch Formation of the Eocene age. Soils occurring at the ridge crests are typically shallow over bedrock and have textures ranging from very gravelly to very cobblely, sandy loams or loams. These soils have textural, depth and drainage characteristics that limit the amount of water these soils can hold and make available for plant growth.

Soils in the valleys are deeper and consist mainly of very gravelly or very cobblely colluvium and alluvium, primarily overlying dry shales.

Vegetation in the area is dominated by sagebrush and desert grasses such as thickspike, wheatgrass, squirreltail, and needlegrass. No listed threatened or endangered plant species are known to occur in the project area.